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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Hannu Makela

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EXAMINER

KONG, SZE-HON

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,937	Applicant(s) MAKELA ET AL.	
	Examiner SZE-HON KONG	Art Unit 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 11/24/2009 have been fully considered but they are not persuasive due to amendment made.
2. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection and newly found reference.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hakkinen (6,616,244) and Lepkofker et al. (US 2004/0021569).

For claims 1, 2, 4, 7-9, 11 and 14, Hakkinen discloses a mine control system for monitoring and determining the location of a mining vehicle in a mine (Abstract), where the mining gallery includes number of sections (Fig. 1). The mining vehicle determines its location by measuring means arranged in the mining vehicle, wireless data transmission for connecting between the control room and the mining vehicles and control information is transmitted from the control room to the mining vehicles (Col. 3, lines 20-33); the mine vehicle comprises an inertial measuring device and ultrasonic scanners and transmit the measured information for creating a map of the mine (Fig. 3

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and col. 3, lines 34-54, col. 4, lines 28-44). It would have been obvious that the measuring information for creating a map of the mine keeps a register of the movements of the mine vehicle in the mine. Hakkinen discloses an inertial measuring device produces continuous location information of the position of the measuring vehicle in the mine and measuring devices, for example, ultrasonic scanners (Col. 4, lines 34-50). It is well known in the art that common inertial measuring devices, for example, gyroscopes and accelerometers determine travel direction.

Hakkinen disclose arranging markers in the mine for location determination and establish data communication between the mining vehicle and the wireless data communication network (Col. 3, lines 24-50) but does not specifically disclose the coverage area of a base station in the first mine section; arranging at least one base station in the second mine section solely for establishing a data communication connection between the mining vehicle and the wireless data communication network in the first mine section, wherein the at least one base station in the second mine section does not determine the location of the mining vehicle; determining the location of the mining vehicle in the first mine section by means of positioning performed in the wireless data communication network based on the location of the signal transmitting at least one base station in the first mine section; determine the location of the mining vehicle in the second mine section only by the at least one measuring device provided in the mining vehicle and transmitting the location data to the mine control system over the wireless data communication network of the first mine section and the wireless network is a radio telephone network.

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Lepkofker discloses a system for tracking persons or things in at least two areas using wireless data communications, including shielded areas, such as between tall buildings, within Buildings and areas in below-grade locations, in communication with tracking unit with inertial tracking (Paragraph 0016). The tracking unit includes accelerometers and gyroscopes to provide distance and heading or directional information mainly within a second area, such as in a building and relay and transmit the location information to a master control station (Paragraph 0007). Location tracking in the first section, just outside the building, the second section uses multiple transceivers with triangulation scheme having coverage that fixes on the position of units being tracked and the distance and direction of the unit are calibrated, updated (Paragraph 0037). Further, within the shielded areas, multiple relay stations are positioned to pass on the direction and location information of each units determined by the inertial measuring devices to the first wireless data communication network (Paragraph 0016). The wireless data communication networks maybe any available communication network, including cellular network, Internet, wireless local area network and wired network (Paragraph 0056). Even further, the locating and tracking of persons and object are applicable to locating and tracking vehicles (Paragraph 0020). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Hakkinen to tracks mine vehicle in the first mining area with multiple base station and relay positional information transmit wirelessly via data communication from the mine vehicle in the second mining area determined by the

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inertial measuring devices, taught by Lepkofker to conveniently and effectively tracks the vehicles according to the area the vehicles reside.

Further, it is obvious the teachings of tracking objects by Lepkofker teach the same tracking functions and environment as the invention presently claimed. It would be obvious to utilize the tracking system taught by Lepkofker in place or improve the tracking system of Hakkinen.

For claim 5, Hakkinen discloses the inertial measuring device produces continuous location information on the position of the vehicle (Col. 4, lines 34-50).

Hakkinen does not disclose comparing the location determined by the measuring device with the location determined by the wireless network when in the first mine section, and updating the location of the mining vehicle to correspond to the location determined by the wireless network. As cited above, Lepkofker discloses in the first area, multiple transceivers, base stations triangulate the tracking units which include the measuring devices, calibrate the distance and direction of the persons and the tracking units, updating the location of the units (Paragraph 0037). It would have been obvious for one of ordinary skill in the art at the time the invention was made to realize Lepkofker teaches the same feature and would have been obvious to modify the invention of Hakkinen to calibrate and update the location of the mine vehicles to accurately track the position of the vehicles.

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For claims 6 and 10, Hakkinen discloses marking additional control marks in the mine for position determination and marking critical locations in the mine, for example drilling location and drill holes to be charged. Col. 4, lines 40-50, discloses updating the control system of the mine with the new section formed (Col. 3, lines 46-54).

Hakkinen does not disclose placing additional base stations belonging to the wireless network. Lepkofker discloses base stations wireless data communication network (Paragraph 0016). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Hakkinen to replace the marks with additional base stations, taught by Lepkofker to expand coverage and improve positioning accuracy at desire locations.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hakkinen (6,616,244), Lepkofker et al. (US 2004/0021569) and as applied to claim 1 above, and further in view of Kageyama (6,480,769).

For claim 3, Hakkinen discloses an operator receive information regarding the picture and location of the position of the mining vehicle (Col. 3, line 65 – col. 4, line 7 and col. 4, lines 62-67 and col. 5, lines 20-24).

Hakkinen does not specifically disclose a manned mining vehicle, but it would have been obvious for one of ordinary skill in the art at the time the invention was made that the unmanned vehicle can be replaced by a manned vehicle where the operator can control the mine vehicle manually. Kageyama discloses monitoring the location of a manned mining vehicle in the mine and transmitting instructions to the operator of the

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mining vehicle (Fig. 2 and col. 7, lines 25-53).

4. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hakkinen (6,616,244), Lepkofker et al. (US 2004/0021569) and as applied to claim 1 above, and further in view of Bahl et al. (6,839,560).

For claims 12 and 13, Hakkinen discloses the network of positioning marks provide altitude or coordinates of the location of the mark, which provide the location information of the mining vehicle (Col. 4, line 62 - col. 5, line 13) but does not specifically disclose establishing a connection to one base station, creating communication between the mine vehicle and the base station whose signal level is the highest in the wireless network, the base stations each have a coverage area of transmitted signals and calculating the position of the mine vehicle in the coverage area of at least two base stations on the basis of the level of signals transmitted by the base stations. Bahl discloses detecting the signal strength of one or more wireless base stations placed at known locations throughout a building and the mobile device can select the base station which provides the highest signal strength (Abstract, col. 4, line 54 – col. 5, line 2). The mobile computers monitor the signal strength of the base stations, coverage area of transmitted signals and the mobile computers can be located using the signal strength of at least two base stations (Table 1 and col. 5, line 41 - col. 6, line 8). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Hakkinen to determine the location and connects the mining vehicle to one or more base stations within the mine in different

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sections based on the coverage area, signal strength of the base stations, taught by Bahl to effectively locate the mining vehicle with most reliable base stations.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(US 2002/0008625) Adams et al. discloses a remote accountability system for tracking and monitoring object using wireless data communication networks having at least one embodiment utilizing a plurality of relay stations, relaying position and operation information from the objects being tracked.

(US 2004/0174264) Reisman et al. discloses a monitoring and tracking network for tracking individuals locally and transfer position information to central monitoring server.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SZE-HON KONG whose telephone number is (571)270-1503. The examiner can normally be reached on 7:30AM-5PM Mon-Fri, Alt. Fri. Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

1/21/2010

/SZE-HON KONG/
Examiner, Art Unit 3661

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661